

2012 Smart Grid Program Peer Review Meeting

DE-OE0000220

LIPA Long Island Smart Energy Corridor

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LIPA Long Island Smart Energy Corridor

Objective

Smart Energy Corridor will:

- (1) Validate Smart Grid technologies;
- (2) Quantify Smart Grid costs and benefits;
- (3) Validate Smart Grid applications at a scale that can be readily adapted and replicated in individual homes and businesses.



Life-cycle Funding (\$K)

Fiscal Years 2010 to 2015

| | |
|---------------------------|--------------------|
| DOE Funding | \$ 12,496K |
| Total Project Cost | \$ 25,293K* |

* Additional funding from LIPA and SUNY Research Foundation

Technical Scope

- Demonstrate Technology (DA, Sub Auto, AMI, DLC)
- Marketing (TOU Rates, Webtools, Visualization)
- Cyber Security (Vulnerability Testing & Hardening)
- Reliability (Phase Bal, Volt Opt, Load Forecasting)
- Public Outreach (Resi / Comm Models)
- Job Creation (Curricula Develop & Training)

Project Targets

- **Technology:** Provide open platform integrated end to end solution
- **Marketing:** Technology adoption and behavior/consumption change
- **Cyber Security:** Identify and mitigate risks to systems and stakeholders
- **Reliability:** Strategies and reactions to reduce outages and shorten durations
- **Outreach:** Educate and excite public on realizable benefits through Smart Grid
- **Job Creation:** Develop and sustain green skills and jobs in the community

| Sources of Funding: | Federal Share | Participant Share | Total |
|-----------------------------|---------------------|---------------------|---------------------|
| Long Island Power Authority | \$5,231,220 | \$5,530,966 | \$10,762,186 |
| Stony Brook University | \$2,822,638 | \$2,822,787 | \$5,645,426 |
| Farmingdale State College | <u>\$4,442,189</u> | <u>\$4,444,000</u> | <u>\$8,886,189</u> |
| Total | \$12,496,047 | \$12,797,754 | \$25,293,801 |

Technical Approach

- 18 ASU Installations – Installed 12 / On Order 6
- 6 PMH Installations – All Installed
- 51 Cap 2-Way Controller Installations – On Order
- 5 Substation RTU Upgrades – All Installed
- 26 Substation Digital Metering – Installed 16 as of 5/18/12
- 3 Substation Control House Solar Panels – Ongoing RFP

- 1380 Resi / 330 C&I Installed (124/21 more by 6/30)
- 500 AMI Meters On Order
- 100 Residential Direct Load Control
- 250 IHDs by 2/4/13

Home Automation
with Smart Meters



Commercial Building
Automation with Smart Meters



SUNY Farmingdale Smart Campus
& Renewable and Sustainable Resource Center
Solar Charging for EV
Smart Home Resi / Comm Models
Education, Training and Public Outreach



Industrial Building Automation
with Smart Meters

Wireless

Route 110

Automated
Distribution



Smart Substation



SUNY Stony Brook
AERTC

Load Modeling and Forecasting
Cyber Security Testing

Visualization / Curriculum Development

Technical Approach

- Marketing
 - Customer engagement / Info Hotline
 - Opt out policy
 - Baselines and control groups
 - New TOU rate design
 - Portal/IHD/Visualization
 - Customer Research
 - Baseline data
 - Control and Test groups
 - Phone survey on SG communications (6/2012)
 - On-line customer profile survey (1/2013)
 - On-line satisfaction with IHD and web (1/2013)
 - Satisfaction focus groups (11/2013)

Milestones and Status - 2011

| High-Level Task | Milestone Date | Status |
|---|-----------------------|------------------------|
| PMH/ASU Order Complete | 01/21/2011 | Completed - 01/24/2011 |
| Finalize and Submit Metrics and Benefits Reporting Plan | 03/15/2011 | Completed - 03/15/2011 |
| OMS Hardware/Software Ordered | 04/04/2011 | Completed - 08/26/2011 |
| Place order for RTU's (long lead item) | 04/06/2011 | Completed - 04/19/2011 |
| Virtual Smart Grid Infrastructure Facility | 07/01/2011 | Completed - 11/01/2011 |
| PMH/ASUs Received | 07/25/2011 | Completed - 07/29/2011 |
| OMS Hardware/Software Received | 08/01/2011 | Completed - 08/26/2011 |
| Smart Grid Testing/Validation Node | 08/02/2011 | Completed - 09/01/2011 |
| Order AMI Meters | 08/11/2011 | Completed - 12/07/2011 |
| All Retrofit Materials Ordered (Phased) | 10/04/2011 | Completed - 09/30/2011 |
| Order of Capacitor Controllers Complete | 10/18/2011 | Completed - 03/30/2012 |
| Receipt of AMI Meters | 12/15/2011 | Completed - 12/22/2011 |
| Installation of Smart Switches Complete | 12/30/2011 | Completed - 12/29/2011 |
| Select AMI Customers | 02/21/2012 | Completed - 12/01/2011 |
| Create Cybersecurity Test Lab | 01/01/2013 | Completed - 11/01/2011 |

Milestones and Status - 2012

| High-Level Task | Milestone Date | Status |
|---|----------------|----------------------------|
| Controllers Received | 03/02/2012 | On Order |
| RTU Retrofits Complete | 04/15/2012 | Completed – 05/11/2012 |
| 500 AMI Meters Installed | 05/31/2012 | Completed – 04/02/2012 |
| Field Inventory Control System | 07/25/2012 | TBD |
| Software for Feeder Load and Reactive Modeling | 07/30/2012 | On Track |
| Campus-wide energy management system complete | 08/31/2012 | On Track |
| Communications Interface Integration Complete | 09/18/2012 | On Track |
| OMS Hardware/Software Installation Complete | 10/03/2012 | Modified Scope |
| Installation of Controllers Complete | 11/01/2012 | On Track |
| Installation of web tools for AMI Customers Complete | 12/11/2012 | On Track |
| Installation and integration of distributed energy (solar) to residential demonstration unit complete | 12/03/2012 | On Track |
| Installation of solar thermal hot water equipment complete | 12/03/2012 | On Track |
| Installation of 6 Additional Smart Switches | 12/31/2012 | On Track |
| Installation of 26 Additional Capacitor Controllers | 12/31/2012 | On Track |
| Installation of 1,855 Additional AMI Meters | 12/31/2012 | On Track – 1,210 Installed |
| Installation of PV Solar Panel Installations at each Substation | 12/31/2012 | On Track |

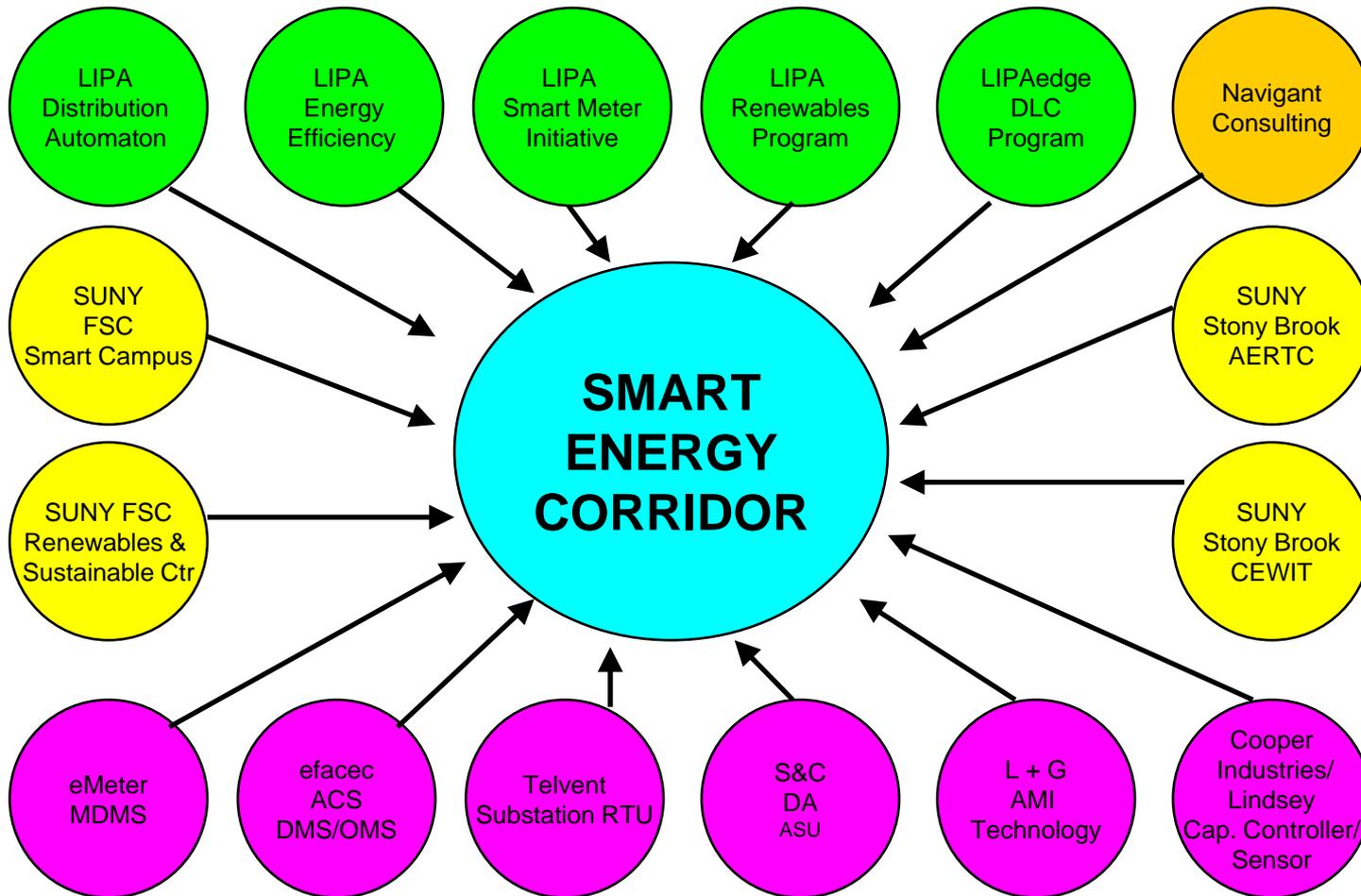
Milestones and Status 2013 - 2015

| High-Level Task | Milestone Date | Status |
|---|----------------|----------|
| Decision Support Software for Optimization Modeling | 01/31/2013 | On Track |
| Develop Higher Learning Curriculum and Public Outreach Pgm | 02/01/2013 | On Track |
| Complete Installation of Solar PV Parking Lot and PHEV Charging | 02/01/2013 | On Track |
| Complete Installation of Residential Systems | 02/01/2013 | On Track |
| Complete Installation of residential wind turbine | 02/01/2013 | On Track |
| Smart louvers installation and integration complete | 02/01/2013 | On Track |
| Commercial demonstration model complete | 02/01/2013 | On Track |
| Residential demonstration model complete | 02/01/2013 | On Track |
| Develop Higher Learning Curriculum and Public Outreach Pgm | 02/01/2013 | On Track |
| Installation of HAN Devices Complete | 02/04/2013 | On Track |
| Automated Billing for AMI Customers Complete | 02/04/2013 | On Track |
| Report: Security Test Results | 11/01/2013 | On Track |
| Report: Tech Controls Prevent/Address Cyber Attacks | 11/01/2013 | On Track |
| AMI Marketing Complete | 12/03/2013 | On Track |
| Report: NIST-Consistent Guidelines, Criteria & Test Suite | 10/28/2014 | On Track |
| Test User Interface & Visualization | 12/31/2014 | On Track |
| Benchmark Advanced Modeling and Load Forecasting Software | 12/31/2014 | On Track |
| Deliver Training | 02/04/2015 | On Track |
| Execute Public Outreach Program | 02/04/2015 | On Track |
| Execute Cybersecurity Testing and Validation | 02/04/2015 | On Track |
| Develop Visualization Tools for Customer Interaction | 02/04/2015 | On Track |
| Develop Enhanced Modeling and Load Forecasting | 02/04/2015 | On Track |
| Deliver Training | 02/04/2015 | On Track |
| Commercialize New Technologies | 02/04/2015 | On Track |

Significance and Impact

- **Improve service reliability**
 - **Automatic outage detection and notification**
 - **Customer specific restoration confirmation**
 - **Enhanced circuit diagnostics and trouble-shooting**
 - **Intelligent circuit switching and routing**
 - **Reduce outage frequency and duration**
- **Customer usage information tools**
 - **Web Portal**
 - **In Home Display**
- **Better understanding and managing energy consumption, conservation efforts, costs, and carbon footprint**
- **Knowledge that allows switching to alternative time of use rates to save money**
- **Convenience of meter reads without a visit from the meter reader**
- **Allows easy integration of green technologies such as:**
 - **Solar**
 - **Electric Vehicles**
 - **Wind**

Interactions & Collaborations



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